

to the values in the annual volumes. These corrections are again three in number:—one required by the Chandler change in latitude; a correction depending, apparently, on some function of zenith distance, and which embraces flexure of the telescope and circle, and removes small uncertainties in the refraction tables. The necessity for the third correction is a little obscure. It is asserted to be necessary on account of small possible errors in the determination of the nadir, or to remove errors arising from abnormal refraction or irregular heating or flexure of the instrument. More details as to the manner in which the last correction has been derived would be welcome. It is contended that the application is justified, since the amount of the probable error of observation is reduced.

A feature of great interest is the comparison between the final places of the catalogue and those given in the earlier Cape catalogues or by other authorities. The main object is, of course, to derive the proper motion, but the real interest centres in the systematic deviations from other catalogues, mainly in the discrepancies shown by those of Cordova. It is impossible within narrow limits to do justice to this discussion, but the points raised are of the highest importance in observational astronomy, and exercise considerable influence on some questions of cosmical interest.

The second work on our list contains four catalogues. Two of these are quite small, and can be dismissed forthwith. One contains nearly a thousand stars culminating south of the zenith of the Cape Observatory. This list includes all stars brighter than 8.5 magnitude which are in the Cape Photographic Durchmusterung, but not in any catalogue of precision; also stars observed with comets or used in survey operations. The main portion, consisting of 3365 stars, culminating north of the Cape zenith, is of more interest and importance. The greater number of the stars is due to the prosecution of a scheme submitted by Sir David Gill to the Comité international des Étoiles fondamentales with the view of forming a zodiacal catalogue sufficiently wide to permit the determination of the moon's place at any observatory and in any part of its orbit by heliometer measures of the distance and position angle of a lunar crater from suitably surrounding stars, or of determining in a similar way the position of any of the larger planets. Of course, it is not possible to determine with the highest accuracy all stars which may be employed for such purposes, but it is hoped that by concentrating the attention of meridian observers on a select number of stars, suitably situated, and by adopting processes likely to eliminate systematic errors, a very considerable improvement in accuracy may result. Several observatories have shown their approval of the scheme by taking part in the observations, and it is hoped that an adequate determination of star places for 1900 will be the outcome, while observations repeated at intervals of twenty-five years would provide all the data required for the most rigorous determination of the places of moon and planets.

The third work is different in its design and more comprehensive in its plan. The star positions for which the means of reduction are supplied number no less than 65,750, and when it is remembered that these stars are situated in a narrow zone, two degrees in width, on the small circle of 31° dec., we are able to learn something of the magnificence of the scheme which proposes to treat the whole sky on a uniform plan. What strikes one with the most force is the fact that a small observatory, the funds of which are necessarily strictly limited by the many demands that are made on the university chest, has been able to carry to a successful issue a scheme of such magnitude: has competed with the resources of great national observatories, and has found itself second to none. Prof. Turner has exhibited qualities of administration of the highest order. He has known how to impart to a comparatively untrained staff the enthusiasm which he himself experienced, and to secure in every part of the work that uniformity of excellence and rigorous accuracy which are essential for the maintenance of its international repute. To him and to the little band which has nobly seconded his efforts we can only offer our heartiest congratulations.

Since Prof. Turner has recalled in the most prominent manner to what extent the scheme has benefited by those who were responsible for the conduct of the observatory in the past, it is not out of place to record here that it was the well-placed generosity of Warren de la Rue that enabled the University of Oxford to play a worthy part in the plan which has been brought to so happy a completion. It is encouraging to remember that the energy of the late Prof. Pritchard was not exhausted, and that, at the age of seventy-nine, he could contemplate embarking upon a new and arduous enterprise. This is the first volume of eight that will appear, and there can be no hesitation in saying that the completion of such a work amply justifies the existence of the University Observatory. Twenty years have passed since de la Rue made his gift, and practically for twenty years the staff of the observatory has been devoted to the completion of this task. Some slight conception of its extent can be inferred from the fact that the titles of the papers immediately connected with this subject fill more than three quarto pages.

At the end of a long article it is impossible to do justice to the many technical points that are necessarily raised in the introduction. It must suffice to illustrate the general policy that Prof. Turner has pursued. This will enable us better to appreciate the exercise of those qualities of administration which have proved so effective. The star images have been measured to the thousandth part of the distance between the *réseau* lines, subtending an angle of 300 seconds in the focal plane of the telescope, or the limit of accuracy has been set at 0".3. This may or may not be the greatest accuracy to which it is desirable to aim, but to have attempted another place of decimals would, says Prof. Turner, have delayed the completion of the work, with the limited staff at Oxford, for several years, and perhaps imperilled its completion altogether. This recognition of his limitations has been amply justified. Again, it no doubt required considerable self-restraint to confine the measures to one series of images, since greater accuracy would probably have been obtained if the measures had been distributed over more images rather than confined to repeated bisections of the same; but such a process would involve the additional labour of taking means between quantities which were not similar, and so give additional risk of numerical errors. Prof. Turner is no doubt warranted in asserting that a just relation has been maintained between the labour expended and the accuracy attained.

W. E. P.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—In accordance with the regulations for the administration of the Gordon Wigan fund, the special board for physics and chemistry reports that the first award of the prize of 50*l.* from the Gordon Wigan income for physics and chemistry for a research in chemistry has been made to F. E. E. Lamplough, scholar (now fellow) of Trinity College, for his research on the determination of the rate of chemical change by measurement of gases evolved.

Dr. Hobson, of Christ's College, has been appointed chairman for the mathematical tripos, part ii., for the year 1907.

A course of lectures on special zoological subjects is being given at the zoological laboratory during the Lent term. The course includes lectures by the following:—Mr. Forster Cooper, on living and extinct elephants; Mr. Stanley Gardiner, (1) marine rock formations, (2) the distribution of marine animals; Mr. Imms, some recent discoveries in the morphology of insects; Mr. Perrin, trypanosomes and spirochaetes; Mr. Potts, parasitism in the Crustacea; Mr. Punnett, (1) metamerism, (2) sex; Mr. Gadow is lecturing on "Environment and Geographical Distribution of Animals" during the Lent and Easter terms.

PROF. GEORG KLEBS, director of the botanical institute of Halle University, has been elected to succeed Prof. Pfützer at the University of Heidelberg.

DR. REINHARD BRAUNS, ordinary professor and director of the mineralogical institute of Kiel University, has been appointed successor to Prof. H. Laspeyres, who retires from the chair of mineralogy and geology in the University of Bonn.

THE governors of the Borough Polytechnic recently received an offer from Mr. Edric Bayley of 5000*l.* towards the estimated cost of the completion of the premises of the polytechnic. The governors, therefore, asked the London County Council to assist them by making a grant of 7000*l.*, and their request was granted at a meeting of the council on January 23. The cost of the scheme, exclusive of lighting, heating, and equipment, is estimated to be about 11,500*l.*

THE annual meeting of the Mathematical Association was held on January 26 at King's College, London. The association now consists of 419 members. Prof. G. H. Bryan, F.R.S., was elected president in succession to Prof. G. B. Mathews, F.R.S. During the course of an address, Prof. Mathews said he earnestly hoped that the new regulations proposed for the Cambridge tripos would be approved. He thinks it will be very unfortunate if, after adopting the principle of the change as the association has done, these regulations are shelved. He asked all those who are inclined, from sentimental or other reasons, to vote non-placet on this question to consider carefully whether it is right to do so after this matter has been carefully thought out for many months by men who are representative mathematicians and representative mathematical teachers at Cambridge. There is a strong desire at Cambridge to make the mathematical scheme there more living, on the one hand, and to bring it more into connection with the general science of mathematics on the other. After Prof. Mathews's address, papers were read by Prof. W. H. H. Hudson, on diagrams of anemoids; by Prof. A. Lodge, on contracted methods in arithmetic; and by Mr. C. S. Jackson, on the elementary arithmetic of the theory of numbers.

THE current number of *Science Progress* contains an article by Sir Arthur Rücker, F.R.S., on the economics of university education. The essay provides an interesting criticism of Adam Smith's theories of education in the light of modern experience. Sir Arthur Rücker leads up to the general criticism that Smith's arguments appear to be based almost entirely on the view that a university is a place where instruction is bought and sold, not a place where professor and student are linked together as leader and follower in a common search after knowledge. Incidentally, opportunities are found to insist upon many aspects of education likely to be ignored by the public. Thus we read:—"as research is largely concerned with the elucidation of the results of hitherto neglected facts, it is found that for many objects mental dexterity can best be fostered by turning the attention of the abler student from the known to the unknown, from information to investigation." In the same number of the review Prof. H. E. Armstrong, F.R.S., writes on the reform of the medical curriculum, treating it as a problem of technical education. Prof. Armstrong says that, so far as chemistry is concerned, "the reform should take the direction of teaching the subject practically and with direct reference to its applications: as every branch of chemistry in turn must necessarily be laid under contribution, chemists need have no fear that their field of action will be thereby unduly limited."

THE annual prize distribution and conversazione of the Northampton Institute, Clerkenwell, E.C., was held on January 25 and 26. The prizes were distributed by Mr. Evan Spicer, chairman of the London County Council, who in his address to the students made special mention of the importance of the engineering work which was being done at the institute, and of the unique character of the work in technical optics. In regard to the latter he remarked that it had received the most sincere recognition of our Continental rivals, inasmuch as work of a similar character was being started in France and Austria. The principal, in his report, referred to the present need of additional accommodation, notwithstanding the fact that the institute has this session occupied the buildings of the British

Horological Institute for its technical optics work. In the display of instruments made in the various laboratories on both evenings, there were several interesting items. A wireless telephone system was made to work successfully across the courtyard, and some interesting experiments were shown with the electric arc used as a telephone receiver, and with the effect of light on selenium cells. There was also an interesting display by the Postal Telegraph Department of some of the newest developments in telegraphy, both of the ordinary kind and wireless telegraphy, a complete De Forest set of the latter being at work. The 75-ton testing machine and the 50-h.p. experimental engine were on view for the first time in the mechanical laboratories, and there was also a new 25-K.V.A. alternator built in the institute with special modifications for experimental purposes, from which some interesting results may shortly be anticipated.

A SCHEME for the organisation of a central lecture theatre for London, on the model of the Berlin "Urania," is being developed by a representative committee, which includes Sir William Ramsay, Sir W. Huggins, and others. A meeting was held last week, under the presidency of Sir William Ramsay, to hear an explanation of the scheme by Mr. Albert Wollheim. The chairman said he had given two lectures at the Berlin "Urania," and was much struck with the crowds that visited the institution and constantly occupied themselves gaining knowledge of scientific facts. Mr. Wollheim explained that the statutes of the Berlin institution exclude the possibility of the undertaking being exploited commercially; all surplus profits, after the distribution of a 5 per cent. maximum dividend, are devoted to the purchase of apparatus or to building extensions or carried to a reserve fund. The proposed London "Urania" would not clash with the work of the learned societies, but would promote their membership. Illustrated popular lectures would be given on subjects of interest to the public in a building centrally situated and easily accessible. In the summer months the "Urania" would be utilised as a centre for educational visits to museums, gardens of scientific societies, and so on. An educational information bureau, a library, and a publication department would be features of the institution. It is interesting in this connection to recall a similar scheme for a civic museum recently outlined before the Sociological Society by Mr. Huntly Carter. It may be hoped that the promoters of these ideas will join hands and cooperate in providing London with a valuable adjunct to its existing educational facilities.

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, December 20, 1906.—Lieut.-Col. Prain F.R.S., vice-president, in the chair.—*Exhibits.*—Two specimens of albino woodlice, *Oniscus asellus*, Linn.: W. M. Webb.—Photograph and dried specimens of *Fockea capensis*, Endl., a plant of considerable interest on account of its great rarity and its apparently great longevity: N. E. Brown.—*Papers.*—Report on the botanical collections made by Dr. W. A. Cunningham in lakes Nyasa, Tanganyika, and the Victoria Nyanza, 1904-5: Dr. A. B. Rendle. Dr. Cunningham spent about three weeks on and about Lake Nyasa, nearly nine months at Lake Tanganyika, and less than a fortnight on the west of the Victoria Nyanza. His object was to make as complete a collection as possible of the plants and animals, especially from Lake Tanganyika, with the view of solving the "Tanganyika problem"—whether the fauna and flora of this lake indicate a former marine connection. The flowering plants, fern allies, and Characeæ, numbering about forty-five species, were, for the most part, well-known and widely-distributed forms, such as *Najas marina*, species of *Potamogeton*, *Pistia Stratiotes*, *Ceratophyllum demersum*, *Myriophyllum spicatum*, *Jussiaea repens*, *Trapa natans*, and *Chara zeylanica*, with others restricted to tropical or subtropical Africa, such as *Ottelia*, *Boottia scabra*, and species of *Utricularia*. In no case was there any suggestion of marine conditions, either past or present, in the representatives of the flora.